TWO RARE SPECIMENS OF HUMAN CESTODES

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PLATE I

In May, 1923, the writers received two rare specimens of human cestodes from their colleague, Dr. I. Maeda, to whom they had been presented by Mr. Nakasuga, a practitioner in Himeji city, near Osaka. One of the specimens has been identified as *Dibothriocephalus parvus*, Stephens, 1907. Dr. Leon (1915) briefly announced that he had found a case in Roumania, but hitherto the worm has never been reported in Japan. The other specimen is a remarkable malformation of *D. latus*.

1. *DIBOTHRIOCEPHALUS PARVUS*, Stephens, 1907

The present specimen was obtained in August, 1922, from a boy aged nine years, the son of a restaurant proprietor in Himeji city. The patient had been in the habit of eating fish from various parts of the country. He had never left his native home except on a trip to Osaka, in the spring of last year.

The strobila without the head measures 2·315 metres in length, and consists of about 1,150 proglottides. During the nine months that had elapsed since the expulsion of the worm, the patient had not shown any sign of the presence of a parasite either in the faeces or in the way of symptoms. Hence it is probable that the head was passed with the strobila, but was overlooked.

The anterior segment is 0·55 mm. broad and 1·0 mm. long, the posterior segment 5·5 mm. broad and 3·0 mm. long, the maximum

segment being 7 mm. broad and 3 mm. long, and occurring six to ten centimetres from the posterior end. The segments of the strobila gradually increase in breadth and in length posteriorly; the former dimension is always greater than the latter, except in a few segments at the anterior extremity which are longer than broad, probably because of the elongated state of the worm. This regular increase in the dimensions of the segments towards the posterior end is interrupted here and there by the irregular extensions and contractions of the segments. The segments, 100 cm. behind the anterior end, are approximately quadrate in shape, both the length and breadth being 3·5 to 4·0 mm. Actual measurements of some segments at various distances from the anterior extremity are as follows:—

	Breadth	Length		Breadth	Length
20th Segment ...	1·5 mm.	1·0 mm.	205th Segment ...	2·6 mm.	0·6 mm.
500th Segment ...	3·5 mm.	2·0 mm.	623rd Segment ...	4·0 mm.	3·5 mm.
1000th Segment ...	6·0 mm.	3·0 mm.	1030th Segment ...	7·0 mm.	3·5 mm.

(The number of the segments given above does not indicate the first segment of the corresponding breadth and length; for instance, the 20th segment is not necessarily the first one of the segments which are 1·5 mm. broad and 1·0 mm. long.)

The posterior border of each segment overlaps the anterior border of the segment following it, and consequently, the lateral margins of the worm present a serrated appearance which differs a little from the description given by Stephens. The surface of the worm is much wrinkled with transverse and longitudinal furrows. The state of corrugation varies according to the condition of the contraction of the segments; thus, in the most extended segments, the transverse wrinkles disappear although the longitudinal ones still exist, while in the contracted segments the transverse and longitudinal furrows are numerous and most conspicuous. Throughout the entire strobila, two (four in all) distinct longitudinal furrows run almost uninterruptedly along the submedian lines on both ventral and dorsal surfaces. Probably these continuous longitudinal furrows are situated on the lines corresponding to the

lateral nerve cords; they lie at a distance of 2 mm. from the lateral margins of a segment 7 mm. wide.

The cirrus opening is situated about one-third to one-fourth of the length of the segment from the anterior margin; the uterine openings cannot be easily made out with a hand-lens owing to the distortion caused by wrinkles on the surface.

The yellowish mass of the uterine loops can be recognised by the naked eye 50 cm. from the anterior end of the worm. As the uterine tube enlarges, the loops form yellowish globular tubercles upon the dorsal surface. Under the microscope, the uterus appears as a central rosette with four to six loops on each side.

The longitudinal layer of the parenchymal musculature is diffuse and more weakly developed than that of *D. latus*, which consists of well developed muscle-bundles.

The testes are very irregularly in the medullary field, either in a single row or in two rows, one of which is directly or obliquely ventral to the other.

The eggs are operculated, oval in shape, similar to but slightly smaller than those of *D. latus*, measuring on an average 58μ in length and 39μ in breadth; the lengths varying from 52·7μ to 67·3μ, and the breadths from 36·5μ to 41μ.*

From the above description, it is clear that our specimen belongs to the species *D. parvus* Stephens. Stephens gave five special characters as distinctive of his species, and the writers incline to concur in his conclusions. His main distinction is, however, based upon the external characters, especially the size of the worm and of the eggs. When identifying parasites, the size of the worm and of the eggs alone is not always sufficient to distinguish the species. In the course of his work on *D. mansoni*, Yoshida found that the adult form of this species varies greatly in size according to the host or other conditions of parasitism. The adult worms obtained from dogs fed with the liguloid larvae from the human host and from snakes measure 2 to 3 metres in length, while the worms from young cats fed with similar liguloid larvae from snakes and frogs are very small, measuring only 30 to 40 cm. in length. During recent years, Japanese investigators have shown experimentally that the tape-

* The writers propose in another paper to compare the internal anatomy of the closely related species, *D. latus*, *D. decipiens* and *D. mansoni*, in regard to which some confusion exists.

worms developed from the liguloid larvae of human beings, frogs and snakes are all the same species, namely, *D. mansoni.* This identification, however, is based chiefly upon the developmental study and external morphology of the worm, and not upon the details of internal structure. Thus, much work remains to be done on the internal morphology of the parasites in order to distinguish *D. latus* from *D. parvus*, and to determine finally whether the liguloid larvae of man, frogs and snakes develop into one and the same species or not.

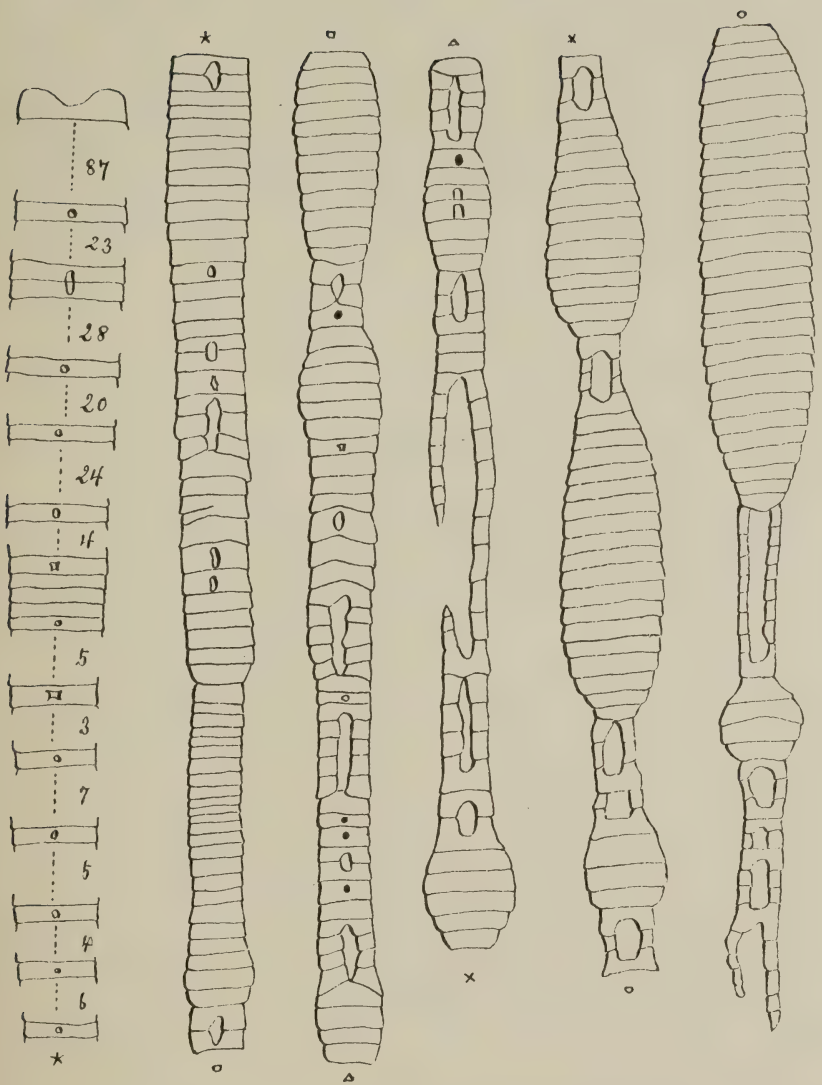
Some Japanese authors are of opinion, from a study of the liguloid larvae, that *D. mansoni* may be identical with *D. decipiens* of the cat. The two forms, however, have not yet been absolutely identified, as a precise description of *D. decipiens* is lacking, especially as regards the size and shape of the eggs. For the same reason, it is not possible to make a satisfactory comparison of *D. decipiens* and *D. parvus.*

2. MALFORMATION OF *DIBOTHRIOCEPHALUS LATUS*

This abnormal specimen was also presented by Mr. Nakasuga, who obtained it from a man aged about 50 years. It is a piece of strobila of 1·1 metres in length, proglottides being four hundred and eighty-eight in number, and the maximum breadth 13 mm. It presents remarkable abnormal segments, especially numerous in the posterior half of the specimen. The posterior end is bifurcated, each limb consisting of six segments. A few wedge-shaped segments are found in the anterior part of the strobila. The most pronounced abnormality is the fenestration which occurs in over forty segments. The largest one is 34 mm. long and stretches over ten segments, one side of it being discontinuous. The second largest fenestration is 22 mm. long covering eight segments, the third 9 mm. long over four segments; then come two fenestrations 8 mm. long over five segments, four 6 mm. long over four segments, five 5 to 5·5 mm. long over three segments, four 3 to 4 mm. long over two or three segments; the others are all rather smaller and are situated on a single segment or between two segments (fig. 1).

In some segments, the uterine loops become enormously enlarged to form a globular tubercle on one side of the worm, while the

Fig. 1.



Semidiagrammatic figure × 3/2. Figures between the segments on the left denote the number of segments without a perforation.

corresponding portion on the other side presents a depression of varying depth. In other segments, the depression becomes deeper and deeper and ultimately causes the fenestration, owing to the removal of the uterine mass. All fenestrations of the present specimen are invariably situated along the median line and represent the position of the uterine masses in the normal segments. In view of the foregoing facts, we consider that this fenestrated abnormality is probably caused by the disintegration of the uterine portion of the segment and the fusion of adjacent fenestrations with each other.

REFERENCES

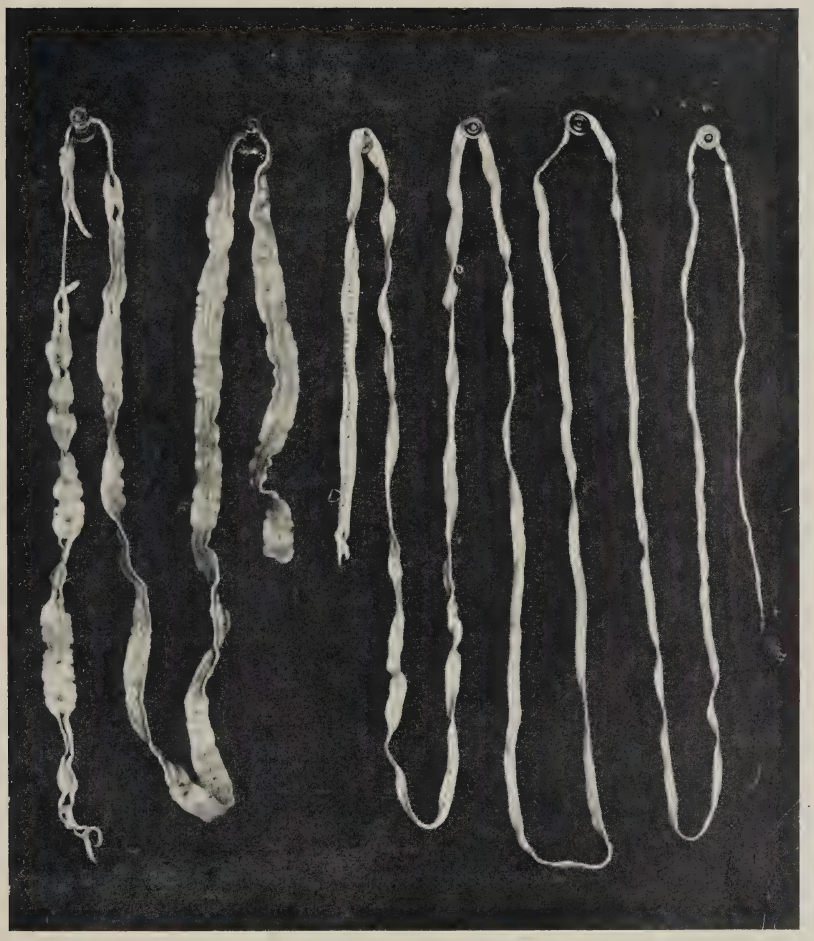
Stephens, J. W. W. (1908). Two New Human Cestodes and a New Linguatulid. *Ann. Trop. Med. & Parasit.*, Vol. I, pp. 549-551.

Leon, N. (1915). Notices helminthologiques. *Centralb. f. Bakt., etc.* 1 Abt. Orig. Vol. LXXVI, p. 522.

EXPLANATION OF PLATE I

Left. *Dibothriocephalus parvus*

Right. Malformation of *Dibothriocephalus latus*



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